

earthquake articles encouraged trust between Historic Seattle and local reporters covering building and development news.

#### ***A Report Card for Seattle***

Because the impact of the earthquake was relatively minor, that is, resulting in no fatalities and, as of today, no loss of significant historic buildings, the natural disaster may have aided preservation in Seattle. The quake provided an opportunity for preservation to be of immediate interest to the general public. It tested the effectiveness of the local preservation community, and showed us where we need improvement. The lessons will undoubtedly be many, but it will probably take years to understand how much we learned from the experience.

Historic Seattle has continued to follow the long-term impact of the quake and is stepping up its advocacy efforts. This year, Historic Seattle hired a preservation advocate to monitor development activity, facilitate grass roots activism, create an online advocacy newsletter, and exchange ideas and information with local government. Nisqually confirmed Historic Seattle's

decision to fund advocacy efforts as an integral but discrete function of this organization.

Today, only one lesson seems clear. The local preservation community can only be effective if it establishes an ongoing, generally positive, and mutually-beneficial relationship with the community at large, including policy makers, any city agency governing buildings and land use, grass roots organizations, the press, allied organizations and other preservationists. Had a strong network predated the quake, it would have been much easier to share information, quickly understand the scope of the impact, and conceive effective response strategies. This network would significantly aid mitigation for future preservation disasters, be they natural or man made.

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Michael Sean Sullivan

## The Nisqually Earthquake

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**A**t 10:54 a.m. on February 28, 2001, there was a shift in the Juan de Fuca Plate 10 miles northeast of the state capital of Olympia and 40 miles beneath southern Puget Sound. During the next 45 seconds a powerful seismic event of magnitude 6.8 carried most of the population of Washington State through the remarkable experience of a major earthquake.

Once the shock of the earthquake subsided, most people who experienced it believed they had been a part of history in the making. Initially, however, while there was obvious damage to a number of significant properties, it was generally believed that because of the depth of the quake, most damage, even to historic properties, was relatively isolated. Now that many months have passed, it has become clear with regard to historic and cultural resources that there has been a significant loss of material history as a result of the

Nisqually earthquake. In more than any other terms, the cost of the disaster must be measured in damage to the region's physical heritage, its historic buildings and sites, and the fabric of its oldest downtowns and neighborhoods.

Within a few days of the earthquake, the Washington State Office of Archaeology and Historic Preservation, working with the Federal Emergency Management Agency (FEMA), assembled preservationists and architects to plan a comprehensive assessment of damage to historic buildings and sites in the shake area. Eight counties, including a major portion of the population and building stock in the state, were declared a disaster zone by FEMA. Already, serious damage to historic buildings in Seattle's Pioneer Square Historic District was heading news stories about the aftermath of the earthquake. Significant damage to the massive domed State Capitol (Legislative) Building in Olympia provided

Vertical crack in  
façade pilaster  
on the Aberdeen  
Post Office  
building. Artifacts  
field photo.

graphic images of the event's magnitude. It also led to an extended closure of the building interrupting a session of the State Legislature. Early FEMA response was already recording a pattern of serious damage to older brick and masonry buildings throughout the region, particularly those that had not undergone seismic upgrades. In the 60 days that followed, damage to more than 350 historic buildings and sites were documented in a massive rapid response effort.

#### **Planning the Assessment Survey**

The logistical planning for the damage assessment fieldwork was developed using a variety of disparate kinds of information. Teams of experienced preservationists, historians, and architects were brought together by Artifacts Inc, an architectural conservation consulting firm based in Tacoma. Basic survey routes and destinations were developed to visit all the registered national, state, and local sites in the disaster counties. Because the field teams also intended to document damage to potential historic properties as well as some older ineligible buildings in historic downtowns and districts, map overlays were developed. The "probability" overlays were created from early railroad and inter-urban route



maps, pre-World War II road maps, and particularly the Works Progress Administration (WPA) State Guidebook (1940) that provided uncluttered maps and narratives of the region's early development and visitor attractions. The pre-war road maps and tours in the WPA guide helped to design efficient travel paths for the field teams and routed them through areas of early settlement and construction without having to wind through suburbs and post-war urban areas.

The field teams worked in assigned counties for up to 10 hours a day. They carried cell phones so newly reported damage could be conveyed directly to the field and assessments could be made immediately. At the base office, support people continued to call ahead to county emergency service contacts, museums, historical societies, libraries and organizations connected with a loose network of people who cared about local landmarks and were likely to be aware of any damaged historic property.

#### **Type of Documentation**

The assessment survey relied on three types of field documentation: written assessment form data, Global Positioning Systems (GPS) readings for location and future mapping, and extensive digital photography. The assessment forms provided a means of recording standardized information about each property, including name, location, construction type, date of construction, ownership, landmark status, GPS reading, and narratives of the damage. The GPS coordinates

### **Building Priority**

#### **Public**

courthouses, town halls, government assembly, schools (grade, middle, high), colleges and universities, libraries, post offices, fire and police stations, railroad depots, park buildings

#### **Private**

assembly, theaters, meeting rooms, fraternal halls, hospitals, medical, churches, institutional, commercial, retail, apartments, multi-housing residences

### **Vulnerability by Construction Type**

(In descending order)

#### **Brick-veneer, unreinforced**

upper walls, parapets, corners, around window openings

#### **Stone Masonry**

upper bearing walls, foundations, veneer sections

#### **Plaster/Stucco**

inverted horizontal areas, around openings, walls and cornices

#### **Concrete**

unreinforced areas, column capitals and bases, foundations, lower walls

#### **Wood frame/Timber**

timber and truss joints, upper walls, window and door openings

*Upper façade and parapet damage to Cadillac Hotel building, Pioneer Square Historic District, Seattle. Artifacts field photo.*

were taken by handheld device and recorded on the forms. Digital format cameras recorded images onto 3-1/2 inch disks.

### **The Findings**

Every earthquake leaves a signature. In the case of the Nisqually quake, it was the damage done by the movement of the event that began as a watery, liquid feeling underfoot followed by a sharp drop and then a long slow sloshing that seemed to move north and south for about 30 seconds. Immediately after the quake, it was clear that the severity of the quake was not determined by the proximity to the epicenter. Ground and soil type ordained the intensity of movement and attendant damage with alluvial valleys, river deltas, and poorly compacted man-made fills suffering the most. Unfortunately, these are the areas in the southern Puget Sound region where people settled, railroads were routed, and towns were built.

Another factor that contributed to historic structure damage was construction type. Unreinforced brick buildings (c.1875-1900) fared the worst, with stone masonry (c.1875-1920) and concrete (c. 1905-1950) following. Wood frame and timber buildings typically were not seriously damaged even in the areas of most severe shaking. The most troubling pattern of destruction was between dissimilar building materials on composite structures. Many commercial buildings with wood or timber framing and brick veneer lost entire exterior walls and parapets as the sharp jolt early in the quake sheared the attachments between materials and the following rolling motion tipped the outer wall away. Similar damage occurred on bridges where steel and concrete connect, on reinforced concrete frame buildings with stone or brick cladding, and on hundreds of wood frame houses where brick chimneys fell away.

In all, more than 364 historic properties in Washington State suffered more than \$52 million in damage. Several National Register sites were either destroyed or are presently slated for demolition because of earthquake damage. In the old logging port of Aberdeen, many of the last remnants of its pioneering downtown are irreparable and destined to be lost. In the railroad town of Auburn, at the foot of Stampede Pass, several three-story brick buildings that make up the core of its glory days are doomed. The brave Wilkeson Arch has fallen. It stood at the entrance to the quarry town that cut the stone for the state capitol on a back road to Mount Rainier. Even in



Seattle's vital Pioneer Square Historic District, where the greatest dollar value damage was experienced, but the best assistance programs are available, several buildings are in jeopardy as a result of opportunistic interests looking for a higher use, among them the venerable Cadillac Hotel.

The earthquake damage assessment project has quickly become a strategic tool in Washington State's efforts to assist directly with repairs to damaged historic properties. The documentation will also help the State Historic Preservation Office conduct prompt Section 106 reviews of federal disaster assistance efforts. And finally, from the standpoint of a historical document, the written accounts and thousands of images in the report make up a startlingly graphic and poignant record of history being both made and lost. \*

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### **Note**

- \* The complete report can be found on the Washington State Office of Archaeology and Historic Preservation's web site at <[www.oahp.wa.gov](http://www.oahp.wa.gov)>. In addition, a more definitive report on the earthquake is available from the Earthquake Engineering Research Institute (EERI) <[www.eeri.org](http://www.eeri.org)>. Among others, the EERI report was sponsored by the University of Washington and the National Science Foundation Pacific Earthquake Research Center (PEER).

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Photos courtesy Artifacts Consulting, Inc.

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